METADATA FOR THE 1991 LEGAL DELTA LAND USE SURVEY DATA

Originator:

California Department of Water Resources

Date of Metadata:

December 5, 2000

Abstract:

The 1991 Legal Delta land use survey data set was developed by DWR through it's Division of Planning and Local Assistance. The data was gathered using aerial photography and extensive field visits, the land use boundaries and attributes were digitized, and the resultant data went through standard quality control procedures before finalizing. The land uses that were gathered were detailed agricultural land uses, and lesser detailed urban and native vegetation land uses. The data was gathered and digitized by staff of DWR's Central District and the quality control procedures were performed jointly by staff at DWR's DPLA headquarters from Central District.

The finalized data include DWG files (land use vector data) and shape files (land use vector data).

Purpose:

This data was developed to aid in DWR's efforts to continually monitor land use for the main purpose of determining the amount of and changes in the use of water.

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Data Development:

1. The aerial photography used for this survey was taken in late June of 1991. The photographs (natural color slides taken from an altitude of about 5,500 feet above ground), were visually interpreted and land use boundaries were drawn on USGS paper 1:24,000 quadrangles.

2. The quad maps were taken to the field as field sheets, and virtually all the areas were visited to positively identify the land use. The site visits occurred in July through September 1991. Land use codes were printed within each area on the field sheets.

3. Using an Intergraph digitizing system, the land use boundaries and attributes were digitized from the field sheets on a digitizing tablet.

4. After quality control/assurance procedures were completed on each file, the data was finalized.

5. The digital data was later taken from the INTERGRAPH system and brought into AUTOCAD. Because the algorithm used in the INTERGRAPH system to project the data into a coordinate system was not accurate, the data had to be reprojected by "rubbersheeting". The four corners of each land use quad file were used to warp the complete quad file into a new projection.

6. The linework and attributes from each DWG quad file were brought into ARCINFO and both quad and surveywide coverages were created, and underwent quality checks. These coverages were converted to shape files using ARCVIEW.

Data Accuracy:

The original land use boundaries were drawn onto USGS quads, then digitized on a digitizing tablet (using an INTERGRAPH system). After this data was brought into AUTOCAD, it was reprojected by “rubbersheeting”, using the four corners of each quad file. It is difficult to say how accurate the linework is. The original digital linework was a result of digitizing hand drawn lines on a USGS 7 1/2 minute quad, so the accuracy was equal to or less than the accuracy of the USGS quads (about 50 feet). After rubbersheeting, the linework’s accuracy is probably reduced a little more.

The land use attribute accuracy is very high, because almost every delineated field was visited in the field. The accuracy is less than 100 percent because some errors must have occurred. There are three possible sources of attribute errors which are:

1) Misidentification of land use in the field (and entering that incorrect attribute on the field sheet);
2) Correct identification of land use, but entering an incorrect attribute on the field sheet, or;
3) Accidentally affixing an incorrect attribute during the digitizing process.

Projection Information:

The data (DWG and shape files) is in a transverse mercator projection, with identical parameters to UTM projections, except the central meridian is -120 degrees (120 degrees west). For comparison, UTM 10 has a central meridian of 123 degrees west, and UTM 11 has a central meridian of 117 degrees west. This projection allows virtually all of the geographic area of California to be in one 6 degree zone (as opposed to two zones, UTM 10 and 11).

Projection:	Transverse Mercator
Datum:	NAD27
Units:	Meter
Scale Reduction:	0.9996
Central Meridian:	120 degrees west
Origin Latitude:	0.00 N
False Easting:	500,000
False Northing:	0.00

Land Use Attributes:

All land use attributes were coded using the Department's Standard Land Use Legend dated January 1981 (81legend.pdf). The legend explains in detail how each delineated area is attributed in the field, and what the coding system is.

The actual land use code that is printed onto the field maps is different in arrangement than the codes that result from the digitizing process. The file attributes.pdf is a detailed explanation of the coding system used for both coding the field sheets, and the codes that end up in digitized form in the database files associated with the shape files.

Information on the AUTOCAD (DWG) Files:

The land use data is available in AUTOCAD 12 format by quad, with one file per quad. The file naming convention is 91DLXXXX.DWG, where XXXX is the DWR quadrangle number. For example, file 91DL3024.DWG is the AUTOCAD drawing file for the 1991 Legal Delta land use survey for quadrangle 3024 (the Courtland quad).

Every quadrangle file has identical layers, nomenclature, and line colors. They are as follows:

Layer	Description	Color
0	AutoCAD's default layer	White
CQN	California DWR quad number	Cyan
GSN	USGS quad number	Cyan
LUB	Land use boundary lines	Yellow
LUC	Land use codes for GRASS	White
LUT	Visible land use text	Green
QB	The quad's boundary	White
QN	Quad name	Cyan

Following is an explanation of the attributes (for each delineated area) in the LUC layer of each quad file:

ACRES:	Number of acres in the delineated area (may or may not be present)
WATERSOURC:	The type of water source used for the delineated area
MULTIUSE:	Type of land uses within the delineated area
CLASS1:	The class for the first land use
SUBCLASS1:	The subclass for the first land use
SPECOND1:	The special condition for the first land use
IRR_TYP1:	Irrigated or non-irrigated, and irrigation system type for the first land use
PCNT1:	The percentage of land associated with the first land use
CLASS2:	The class for the second land use
SUBCLASS2:	The subclass for the second land use
SPECOND2:	The special condition for the second land use
IRR_TYP2:	Irrigated or non-irrigated, and irrigation system type for the second land use
PCNT2:	The percentage of land associated with the second land use
CLASS3:	The class for the third land use
SUBCLASS3:	The subclass for the third land use
SPECOND3:	The special condition for the third land use
IRR_TYP3:	Irrigated or non-irrigated, and irrigation system type for the third land use
PCNT3:	The percentage of land associated with the third land use

Information on the Shape Files:

Shape files were created for each quad, and one for the whole survey area. The naming conventions used for the quad DWG files is used for the quad shape files (for example, 91DL3024.shp, 91DL3024.shx, and 91DL3024.dbf for quad number 3024, the Courtland quad). The name of the shape file for the whole survey area is 91DL.shp (and .dbf and .shx). Following is an explanation of the land use attributes in the DBF files:

BL_X:	This is the X coordinate of the interior point in the delineated area
BL_Y:	This is the Y coordinate of the interior point in the delineated area
ACRES:	Number of acres in the delineated area (may or may not be present)
WATERSOURC:	The type of water source used for the delineated area
MULTIUSE:	Type of land uses within the delineated area
CLASS1:	The class for the first land use
SUBCLASS1:	The subclass for the first land use
SPECOND1:	The special condition for the first land use
IRR_TYP1A:	Irrigated or non-irrigated for the first land use
IRR_TYP1B:	Irrigation system type for the first land use
PCNT1:	The percentage of land associated with the first land use
CLASS2:	The class for the second land use
SUBCLASS2:	The subclass for the second land use
SPECOND2:	The special condition for the second land use
IRR_TYP2A:	Irrigated or non-irrigated for the second land use
IRR_TYP2B:	Irrigation system type for the second land use
PCNT2:	The percentage of land associated with the second land use
CLASS3:	The class for the third land use
SUBCLASS3:	The subclass for the third land use
SPECOND3:	The special condition for the third land use
IRR_TYP3A:	Irrigated or non-irrigated for the third land use
IRR_TYP3B:	Irrigation system type for the third land use
PCNT3:	The percentage of land associated with the third land use
UCF_ATT:	Concatenated attributes from MULTIUSE to PCNT3

Important Points about Using this Data Set:

1. The land use boundaries were hand drawn directly on USGS quad maps and then digitized. They were drawn to depict observable areas of the same land use. They were not drawn to represent legal parcel (ownership) boundaries, or meant to be used as parcel boundaries.

2. This survey was a "snapshot" in time. The indicated land use attributes of each delineated area (polygon) were based upon what the surveyor saw in the field at that time, and, to an extent possible, whatever additional information the aerial photography might provide. For example, the surveyor might have seen a cropped field in the photograph, and the field visit showed a field of corn, so the field was given a corn attribute. In another field, the photograph might have shown a crop that was golden in color (indicating grain prior to harvest), and the field visit showed newly planted corn. This field would be given an attribute showing a double crop, grain followed by corn. The

DWR land use attribute structure allows for up to three attributes per delineated area (polygon).

In the cases where there were crops grown before the survey took place, the surveyor may or may not have been able to detect them from the field or the photographs. For crops planted after the survey date, the surveyor could not account for these crops. Thus, although the data is very accurate for that point in time, it may not be an accurate determination of what was grown in the fields for the whole year. If the area being surveyed does have double or multicropping systems, it is likely that there are more crops grown than could be surveyed with a "snapshot".

3. If the data is to be brought into a GIS for analysis of cropped (or planted) acreage, two things must be understood:

   a. The acreage of each field delineated is the gross area of the field. The amount of actual planted and irrigated acreage will always be less than the gross acreage, because of ditches, farm roads, other roads, farmsteads, etc. Thus, a delineated corn field may have a GIS calculated acreage of 40 acres but will have a smaller cropped (or net) acreage, maybe 38 acres.

   b. Double and multicropping must be taken into account. A delineated field of 40 acres might have been cropped first with grain, then with corn, and coded as such. To estimate actual cropped acres, the two crops are added together (38 acres of grain and 38 acres of corn) which results in a total of 76 acres of net crop (or planted) acres.

4. Water source and irrigation type information were not collected for this survey.

5. During the transfer of data from the INTERGRAPH system to the AUTOCAD system, some attributes were lost. For those polygons that were attributed with either “D” (double cropped) or “I” (intercropped), the second crop has either an asterisk, blank, or zero in the two fields “IRR_TYP2PA” (irrigated or non-irrigated) and “IRR_TYP2PB” (type of irrigation system). There should have been either and “i” or “n” in the “IRR_TYP2PA” field, and a “U” or “*” in the “IRR_TYP2PB” field.